THE EFFECT OF NANO-FILLED RESIN COATING ON FLUORIDE RELEASE IN A NEW CONVENTIONAL GLASS IONOMER CEMENT

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The objective of this study was to evaluate fluoride release amounts and patterns from high strength tooth filling material (EQUIA™) which is a conventional Glass Ionomer Cement, and investigate whether the application of nano-filled resin-based coating with different thicknesses has any effect on fluoride release from this new material. A total of 120 disc shaped specimens (10 x 2 mm) of EQUIA™ were fabricated according to manufacturer's instructions. Samples were subsequently divided into three groups: no resin coating; coated with nano-filled resin-based coat; coated with nano-filled resin-based coat then subjected to abrasion using a mechanical tooth brushing machine. Each specimen was soaked individually into a polyethylene container with 20 ml of distilled water and stored at 37ºC. Samples from each group were soaked for four time points; 1 day, 7 days, 14 days and 21 days. Fluoride content was then measured using a fluoride-specific ion electrode (Model 9609BNWP, Orion Research, Boston MA, USA). The effects of time and coating on fluoride release were analyzed using two-way analysis of variance (ANOVA), with multiple comparisons performed using the Sidak method at an overall 5% significance level. The distribution of the fluoride release measurements was examined and a natural logarithm transformation of the data was necessary to satisfy the ANOVA assumptions. The time-by-coating interaction was significant ($p<0.0001$). We can conclude that fluoride level significantly increased with time for non-coated and coated then abraded samples only. Application of resin coat significantly reduced fluoride release. Also, subjecting coated samples to tooth brush abrasion increased the fluoride release when compared to coated specimens but was still significantly less than uncoated samples.

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